UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: APR 25 1980

SUBJECT: ACTION MEMORANDUM - Notice of Application to Construct and Preliminary Determination, SOHIO Petroleum Company and Atlantic Richfield Company (ARCO/SOHIO) at Prudhoe Bay, Alaska

FROM: Lloyd A. Reed, Director
Enforcement Division (M/S 517)

TO: Donald P. Dubois
Regional Administrator (M/S 601)

DISCUSSION

On October 17, 1979, EPA received from ARCO/SOHIO a complete PSD application requesting approval to install additional gas fired turbines and heaters at the Prudhoe Bay Oil Field at Prudhoe Bay, Alaska.

The project is subject to PSD review for emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and particulate matter (PM). There are several points you should be made aware of regarding the proposed project.

1. On September 10, 1979 the Federal New Source Performance Standards were promulgated for stationary gas turbines for SO_2 and NO_x. The emission limits proposed by the Company are consistent with NSPS and represent BACT for the proposed turbines. Emissions of NO_x can be reduced to less than the limits specified in our determination through the use of water injection. However, water is scarce in that region and elaborate methods would have to be employed to keep the water supply from freezing. For this reason, water injection will not be required. Instead, dry controls meeting NSPS are proposed, and constitute BACT for the turbines.

2. The NO_x controls for the process heaters proposed by the Company differ from that proposed by our technical staff. ARCO/SOHIO proposes to limit NO_x emissions by burning natural gas in lieu of oil and to use proper maintenance and operating conditions to achieve proper combustion.

Our evaluation suggests that the installation of low NO_x burners can reduce NO_x emissions by 60 to 75 percent in process heaters with heat input greater than 43 million BTU/hr. At this time there are no new source performance

standards for heaters, but our technical staff believes that low NO_x burners constitute the state-of-the-art control for this particular process. The low NO_x burners may be slightly more expensive than the proposed conventional burners, but the low NO_x burners are technically and environmentally superior when compared to the amount of NO_x emissions that would result from the burners proposed by ARCO/SOHIO.

While process heaters greater than 43 million BTU/hr will be controlled and monitored, the space heaters less than 43 million BTU/hr will not. There is a twofold reason why the same stringent controls should not be imposed on the space heaters. First, the smaller heaters are not as offensive as the larger process heaters which produce the majority of NO_x emissions. Second, low NO_x burners have not been tried on the smaller space heaters and the efficiency and emission reduction characteristics of their use in this application is unknown.

3. The actual installation of turbines and process heaters at each pump station may differ in size and configuration from that stated in the PSD application. ARCO/SOHIO contends that turbine size may change due to cost, turbine availability and technical/engineering considerations which were not taken into account or were unknown when the PSD application was submitted. Since a PSD permit is issued for a specific project with specific characteristics, ARCO/SOHIO was requested to submit additional data examining a range of logical variations of turbine and heater size to reflect a likely worst case ambient impact scenario. The limits imposed in the preliminary determination are based on the worst case scenario. Once specific sized units are known, they will be modeled and the actual air quality impacts will be determined. Because worst case conditions have been examined and the actual installation will have less impact than the permitted installation, the revised permit will not require public participation as long as the variation is within the scope of the application.

Under the probable worst case scenario, emissions of NO_2 will not violate the national ambient air quality standard.

RECOMMENDATION

The emission limits indicated in the preliminary determination document reflect BACT. Construction of the